

REMARKS

Claims 1-12 are all the claims pending in the application. By this Amendment, Applicant cancels claims 1-11 without prejudice or disclaimer. In addition, Applicant adds claims 13-22, which are clearly supported throughout the specification

The Examiner maintained the rejection of claims 1-12 as being allegedly anticipated by Ikeda et al. (JP 60-18648), hereinafter “Ikeda”. Applicant respectfully traverses these grounds of rejection at least in view of the following exemplary comments.

In the previous Amendment filed on August 10, 2007, Applicant added new independent claim 12. The new independent claim 12 recites **a method** of electrically isolating a stator winding. The method of claim 12 comprises, *inter alia*, spraying a powder of an electrical insulation material on a slot peripheral wall of each slot to form an insulation coating. Claim 12 also recites cutting into the insulation coating on the pair of slot side walls at the vicinity of the slot opening to form a pair of holding grooves opposing to each other.

The Examiner contends that claim 12 recites a product by process. The Examiner states that because claim 12 is a product by process, the method of forming the device is not germane to the issue of patentability of the device itself. See Office Action page 9. Applicant respectfully disagrees with the Examiner because claim 12 is directed to a method of electrically isolating a stator winding. It is not directed to a product as alleged by the Examiner. Therefore, the Examiner must show each of the steps recited in the method of claim 12. However, the Examiner has not shown how claim 12 is anticipated. In fact, the Examiner admits that Ikeda does not disclose “spraying a powder of an electrical insulation material on a slot peripheral wall of each slot to form an insulation coating” as recited in claim 12. For example, the Examiner

states that “Ikeda et al. teaches insulation and not the method of applying and making the insulation”. See Office Action, Response to Arguments at page 9. Therefore, claim 12 is not anticipated by Ikeda.

In fact, Ikeda discloses inserting the insulator layer 8 into the slot 7, which means that the insulation layer is manufactured separately and inserted into the slot 7 instead of actually spraying a coating of insulation on the side walls of the slots. In short, Ikeda clearly does not disclose or even remotely suggest spraying a powder of an electrical insulation material on a slot peripheral wall. Furthermore, in Ikeda, there is no disclosure or suggestion of cutting into the insulation coating on the pair of slot side walls. For Examiner’s convenience, Applicant submits herewith a translation of the Ikeda reference. For at least these exemplary reasons, claim 12 is patentably distinguishable from Ikeda.

Next, independent claim 13 is a method claim that recites features similar to, although not necessarily coextensive with, the features argued above with respect to claim 12. Therefore, arguments presented with respect to claim 12 are respectfully submitted to apply with equal force here. For at least substantially analogous exemplary reasons, therefore, independent claim 13 is patentably distinguishable from Ikeda. Claims 13-22 are patentable by virtue of their dependency and for additional features set forth therein.

This Amendment is being filed together with a Request for Continued Examination. Accordingly, entry and consideration are appropriate.

In view of the above, reconsideration and immediate allowance of this application are now believed to be in order, and such actions are hereby solicited. **If any points remain in**

issue, the Examiner is kindly requested to contact the undersigned attorney at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,

/Nataliya Dvorson/
Nataliya Dvorson
Registration No. 56,616

SUGHRUE MION, PLLC
Telephone: (202) 293-7060
Facsimile: (202) 293-7860

WASHINGTON OFFICE

23373

CUSTOMER NUMBER

Date: February 4, 2008

Translation of the Specification of JU60-18648A

SPECIFICATION

1. Title of the Invention

SLOT INSULATION DEVICE OF DYNAMO-ELECTRIC MACHINE IRON CORE

2. Claim

A slot insulation device of a dynamo-electric machine iron core, wherein in a slot accommodating a coil of an iron core formed by cutting a thick steel plate, an insulating member shaped like a slot is inserted, an opening part of the insulating member is provided with a rugged groove, and a wedge is inserted and locked in the groove.

3. Detailed Description of the Invention

This invention relates to an insulating device in a slot of a dynamo-electric machine iron core.

As this type of insulation, methods shown in Fig. 1 and Fig. 2 have been adopted heretofore. In Fig. 1, the reference numeral 1a is a core, which is formed by stamping a thin steel plate and provided with a slot 7 accommodating a coil 2, and a plurality of cores are stacked to form an iron core block 1 of a dynamo-electric machine. The reference numeral 3 is an insulating member for insulating the coil 2 from the iron core. When the voltage between the coil and the iron core is low, the insulating member 3 is inserted to the slot 7, and

varnish is made to adhere to an element wire of the coil 2 to form an insulating film 5. When the voltage between the coil and the iron core is high, the insulated coil element wire is further insulated with an envelope 4. In the case of a further higher voltage, both of the above are sometimes used jointly. The reference numeral 6 is a wedge.

For insulation in this type of conventional slot, insulated element wires are bound into a bundle and have an insulating film formed by taping or the like, so it is necessary to make the dimensional accuracy of the coil and the dimensional accuracy of the slot severe. Further, in the case where an insulating member is inserted to the slot, there is a disadvantage that it takes trouble to insert a sheet-like insulating member to the slot before inserting the coil. In both of the above cases, after stacking the iron cores on the shaft, the insulated coil is inserted to the slot, or insulating paper is put into the slot.

This invention has been made to overcome the disadvantages of the prior art. According to this invention, in every iron core block formed by cutting a thick steel plate, an insulating member shaped like the slot is previously inserted to insulate the interior of a slot in which a coil is put, and a rugged wedge insert groove is formed in an opening part of the insulating member, so that it is not necessary to make the dimensional accuracy of slot working severe as

compared with the conventional one, and it is possible to achieve slot insulation inexpensively and with high reliability.

The embodiments of the invention will now be described with reference to the drawings. In Fig. 5, the reference numeral 1 is an iron core formed by cutting a thick steel plate and having a slot 7 accommodating a coil, the reference numeral 8 is an insulating member shaped like the slot, which is inserted to the slot 7, and the opening end part of which is provided with a rugged groove 9, and a wedge 6 is inserted and locked in the groove 9. The reference numeral 10 is a material, which is inserted so as to prevent the coil (not shown) from being damaged when the wedge 6 is inserted. In this type of structure, the slot-shaped insulating member 8 accommodating the coil is previously inserted to the slot 7 of the iron core 1, the iron core block 1 is put on the shaft, and then the coil is put therein, whereby the coil whose element wire is insulated can be simply inserted, and even in the case of high voltage between the iron core and the coil, slot insulation can be simply achieved without taping an insulating member around the coil, so that it is possible to provide a dynamo-electric machine of high reliability inexpensively.

In the iron core, which is obtained by cutting a thick steel plate, the dimensional accuracy of the slot shape is inferior to that of the conventional iron core whose slot is

punched by a press, and when the iron cores are stacked on a shaft, the slots are slightly shifted in the axial direction so that the workabilities of inserting insulating paper and coil and of driving the wedge are inferior.

Therefore, in the invention, the rugged groove 9 for driving the wedge 6 therein is formed in this insulating member 8 shaped like a slot, and the wedge is driven in the groove. In this case, when the wedge is formed to have a little elasticity, shifting of the slots can be absorbed. As shown in Fig. 5, when the opening part of the slot is provided with a rugged part for driving the wedge therein, an effect of remarkably increasing the area for putting the coil in the slot is achieved.

Although the above embodiment shows the case where the insulating member 8 has the rugged groove 9, as shown in Fig. 6 and 7, it may have a projecting part 11, and further it may have a recessed part 12 as shown in Fig. 8 and Fig. 9.

According to the invention, as described above, the insulating member having the same shape as the slot is inserted in the slot of the iron core and further the insulating member is provided with the groove for driving the wedge, therein whereby even if the slot is slightly shifted, the wedge can be easily driven and also the effect of remarkably increasing the area in the slot can be also achieved, which may lead to the advantage of miniaturizing the dynamo-electric machine.

4. Brief Description of the Drawings

Figs. 1 and 2 are perspective views of slot parts of the conventional dynamo-electric machines;

Figs. 3 and 4 are perspective views showing a coil element wire;

Fig. 5 is a sectional view of a slot part of a dynamo-electric machine according to one embodiment of the invention; and

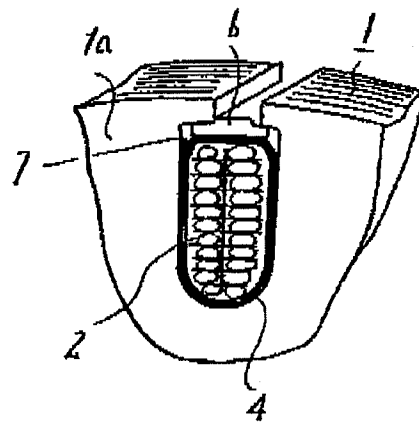
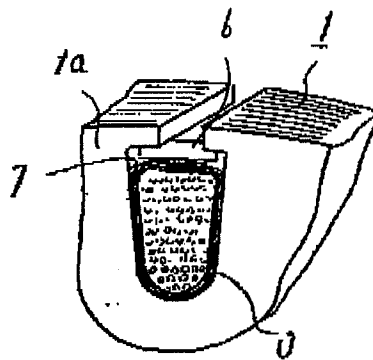
Figs. 6 to 9 are sectional views of slot parts, respectively showing another embodiment of the invention.

In the drawings, the reference numeral 1 is an iron core, 7 is a slot, 8 is an insulating member, 9 is a groove, 11 is a projecting part, and 12 is a recessed part.

In the drawings, the same reference numerals designate the same or corresponding parts.

FIG. 1

第 1 図

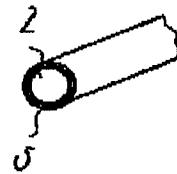


第 2 図

FIG. 2

FIG. 3

第 3 図



第 4 図

FIG. 4

570

実用 60-18648

代理人 大 岩 増 雄

Fig. 5

第 5 圖

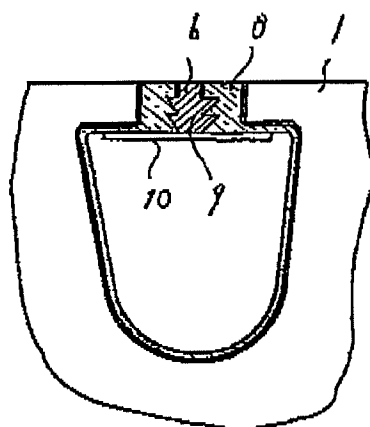


FIG. 7

第 7 圖

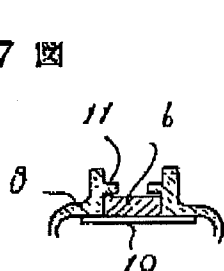
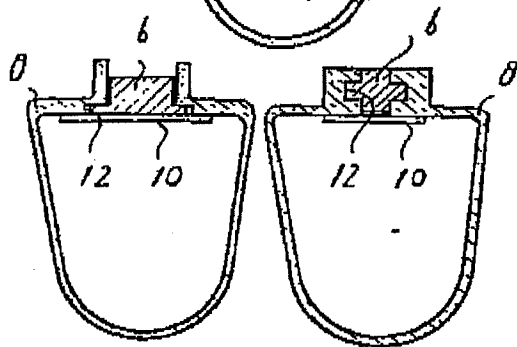
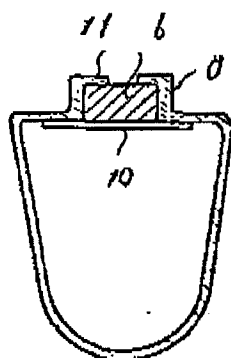


FIG. 6

第 6 圖



第 9 圖

FIG. 9

第 8 圖

FIG. 8

571